WE CLAIM:

1. A method of selecting a material for use as the expansive element in a thermoelastic design by deriving an indicator of the material's potential effectiveness for that use, said method including the step of calculating a dimensionless constant $\varepsilon\gamma$ for that material in accordance with the formula:

$$\varepsilon\gamma = \frac{E\gamma^2 T}{\rho C}$$

wherein E is the Young's modulus of the material; γ is the coefficient of thermal expansion; T is the maximum operating temperature, ρ is the density and C is the specific heat capacity.

2. The method of Claim 1 further including the step of normalising the dimensionless constant relative to that of silicon to a value ε which is achieved by deriving the value $\varepsilon\gamma$ for the material of interest at the relevant temperature value and dividing this by the value of ε obtained for silicon at that same temperature.

3. The method of Claim 1 further including the step of eliminating certain materials by requiring a pre-determined resistivity range.

4. The method of Claim 3 further wherein the resistivity range is between 0.1μΩm and 10.0μΩm.

5. An expansive element in a thermoelastic design that is made from any functionally suitable material or combinations of materials selected from a group including:
silicides and carbides of titanium.

6. An expansive element according to Claim 5 further including one or more of the following properties:

(e) a resistivity between 0.1μΩm and 10.0μΩm;

(f) chemically inert in air;

(g) chemically inert in the chosen ink; and

(h) depositable by CVD, sputtering or other thin film deposition technique.

7. An expansive element in a thermoelastic design that is made from any functionally suitable material or combinations of materials selected from a group including:

borides, silicides, carbides and nitrides of tantalum, molybdenum, niobium, chromium, tungsten, vanadium, and zirconium.

8. An expansive element according to Claim 7 further including one or more of the following properties:

(i) a resistivity between 0.1μΩm and 10.0μΩm;

(j) chemically inert in air;

(k) chemically inert in the chosen ink; and

(l) depositable by CVD, sputtering or other thin film deposition technique.

9. An expansive element in a thermoelastic design that is made from any functionally suitable alloy material or combinations of alloy materials selected from the group including:

borides, silicides, carbides and nitrides of titanium, tantalum, molybdenum, niobium, chromium, tungsten, vanadium, and zirconium.

10. An expansive element according to Claim 9 further including one or more of the following properties:

(m) a resistivity between 0.1μΩm and 10.0μΩm;

(n) chemically inert in air;

(o) chemically inert in the chosen ink; and

(p) depositable by CVD, sputtering or other thin film deposition technique.